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Solution by G. B. M. ZERR, A. M., Ph.D., The Temple College, Philadelphia, Pa., and J. E. SANDERS, Hackney, Ohio.

$$\frac{\$A + \$B}{1+p} = \frac{\$6300}{1.05} = \$6000 = \text{cost of both farms.}$$

$$\$A + \$B - \frac{\$A + \$B}{1+p} = \frac{\$p(A+B)}{1+p} = \frac{\$6300 \times .05}{1.05} = \$300 = \text{gain.}$$

$$C + \frac{p(A+B)}{1+p} = \frac{C+p(A+B+C)}{1+p} = \$4000 + \$300 = \$4300 = \text{cost of dearer farm.}$$

$$\frac{A+B}{1+p} - \frac{C+p(A+B+C)}{1+p} = \frac{(A+B)(1-p)}{1+p} - C = \$6000 - \$4300 = \$1700$$

=cost of cheaper farm.

Also solved in a similar manner and with same result by G. W. GREENWOOD.

ALGEBRA.

171. Proposed by IDA M. SCHOTTENFELTZ, A. M., New York, N. Y.

$$ay^2 + a = bxy + cx, \quad bx^2 + b = axy + cy. \quad \text{Solve for } x \text{ and } y.$$

Solution by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics, The Temple College, Philadelphia, Pa.

$$ay^2 + a = bxy + cx \dots (1). \quad bx^2 + b = axy + cy \dots (2).$$

$$\text{From (1), } x = a(y^2 + 1)/(by + c) \dots (3).$$

$$(3) \text{ in (2) gives } [(a^2 + b^2)y^2 + 2bcy + a^2 + c^2](cy - b) = 0.$$

$$\therefore y = b/c, y = -\frac{1}{a^2 + b^2} \{bc \mp a\sqrt{-(a^2 + b^2 + c^2)}\}.$$

$$x = a/c, x = -\frac{1}{a^2 + b^2} \{ac \pm b\sqrt{-(a^2 + b^2 + c^2)}\}.$$

Also solved by MARCUS BAKER.

GEOMETRY.

193. Proposed by PROFESSOR BEYENS.

Si le rapport du segment d'une base de la sphère à l'hémisphère est m/n , le rapport de l'hauteur du segment à deux bases qui resultera au rayon est égal à $2\sin\frac{1}{2}[\sin^{-1}(n-m)/n]$. [Problem 9699, *Educational Times*.]

Solution by J. R. HITT, Goss, Miss.; G. B. M. ZERR, A. M., Ph. D., The Temple College, Philadelphia, Penn., and G. W. GREENWOOD, B. A., Professor of Mathematics and Astronomy, McKendree College, Lebanon, Ill.

Let R denote radius of sphere, h the altitude of segment of two bases, $R-h$ =altitude of segment of one base. Then, $\pi(R-h)^2[R-\frac{1}{2}(R-h)]/\frac{2}{3}\pi R^3$